

ABSTRACT

A local dry etching method for a SOI wafer capable of flattening an active silicon layer to a layer thickness of a target at a high throughput and to a required accuracy by using a multi-step local dry etching apparatus wherein the apparatus comprises first and second vacuum chambers, a small diameter nozzle, a large diameter nozzle of a diameter larger than that of the small diameter nozzle, an activated species gas generator for generating activated species gases to be blown out of each of the nozzles, each of feeding devices disposed in each of the vacuum chambers for providing a relative speed between the SOI wafer and each of the nozzles to conduct scanning and transportation device, in which the active silicon layer of the SOI wafer is etched in the first vacuum chamber to remove the surface unevenness and the active silicon layer is etched to a required layer thickness in the second vacuum chamber.